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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,705	03/22/2004	Karen Irene Winey	UPNA-0017	8807

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WOODCOCK WASHBURN LLP
ONE LIBERTY PLACE, 46TH FLOOR
1650 MARKET STREET
PHILADELPHIA, PA 19103

EXAMINER

HU, HENRY S

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/805,705	Applicant(s) WINEY ET AL.	
	Examiner Henry S. Hu	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment of August 17, 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31, 33-45, 59 and 60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31, 33-45, 59 and 60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to **Amendment** filed on August 17, 2006. With the Applicants' amendment, **Claim 1 was amended; Claim 32 and non-elected Claims 46-58 (Group II) were cancelled, while new Claims 59-60 were added.** To be more specific, parent Claim 1 was amended to add the limitation of Claim 32 as "at least a portion of said plurality of nanotubes are characterized as being agglomerates of nanotubes smaller than about 100 microns", dependent Claim 32 was cancelled accordingly.

After consideration the scope of limitation, newly submitted Claims 59 and 60 are joined with elected Group I. **Claims 1-31, 33-45 and 59-60** with three independent claims (Claim 1, Claim 59 and Claim 60) are now pending. An action follows.

Response to Argument

2. Applicant's argument filed on August 17, 2006 has been fully considered but they are not persuasive. The focal arguments related to the patentability will be addressed as follows: In view of claim amendment and claim addition as well as Applicants' argument on page 8 of Remarks, the scope of parent Claim 1 has been changed. Therefore, new 112-2nd claim rejection is applied, while pure 103 rejections by McAllister in view of Shambaugh or Lobovsky are sustained after a close examination.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On **Claim 1 at lines 3-4**, the phrase of "**at least a portion of**" may render claim **indefinite** since it is unclear how much is involved to be called a portion. After a close examination, Examiner suggests using a more clear language. In a very close examination, the disclosure in paragraph # **0019** does not show or suggest any point or range.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. *The limitation of parent Claim 1 in present invention relates to **a process**, comprising:*
- (A) **providing a nanotube dispersion comprising a plurality of nanotubes and a liquid, wherein at least a portion of said plurality of nanotubes are characterized as being agglomerates of nanotubes smaller than about 100 microns**;*
- (B) **contacting said nanotube dispersion with a polymer melt**; and*
- (C) **mixing said nanotube dispersion with said polymer melt to provide a nanotube composite.***

*Newly submitted two independent Claims 59 and 50 are related to the process of original Claim 1 but **using sonicated mixing for a specific nanotube and a specific solvent**. See other limitations of dependent Claims 2-31, 33-45.*

6. Claims 1-31, 33-45 and 59-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over McAllister et al. (US 5,130,342) in view of Shambaugh (US 7,001,556 B1) or Lobovsky (US 6,764,628 B2) for the reasons set forth in paragraphs **5-8** of office action dated 5-17-2006 as well as the discussion below.

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7. **Applicants:** Applicants have now claimed in three independent **Claims 1, 59 and 60** an unexpected way of **producing a nanotube/polymer composite** by contacting a nanotube dispersion with a polymer melt. The key point on this amendment is that **“at least a portion of** said plurality of nanotubes is in the form of agglomerates of nanotubes smaller than about 100 microns” from Claim 32 is incorporated into parent Claim 1, while newly submitted two independent **Claims 59 and 50** are related to the process of “original Claim 1” but **using sonicated type of mixing for a specific nanotube and a specific solvent.**

103 rejections (by McAllister in view of Shambaugh or Lobovsky) cannot stand by this amendment since Applicants’ process is considerably more complicated than simply adding fillers to polymer (see page 8 of Remarks). A hindsight reconstruction may be used. In summary, the motivation to link is thereby missing for 103 rejections.

8. **Examiner:** Current three Parent **Claims 1, 59 and 60** are all involved in **producing a nanotube/polymer composite.** The different between Claim 1 and newly submitted Claims 59-60 is that: **Claims 59 and 50** are related to the process of “original Claim 1” but using sonicated type of mixing for a specific nanotube and a specific solvent, while **current Claim 1** is now incorporated new limitation of dependent Claim 32.

Attention is directed to the fact that open language “comprising” is used in the process in each of Claims 1, 59 and 60. As discussed earlier, primary reference **McAllister** has already disclosed a process to prepare a composite of a **particulate-filled microporous thermoplastic**

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polymer shaped article which may be in the form of a film, a fiber, or a tube (abstract, line 1-9).

The process comprises **six continuous steps** (a) – (f) as specified on column 5, line 12-34.

McAllister further discloses that particulate particles in the submicron or low micron size can be effectively used as long as they are capable of forming a colloidal dispersion with the compatible liquid and insoluble in the melt blend of the thermoplastic polymer and compatible liquid (column 6, line 55 –column 7, line 20). Therefore, the combination of steps (a) and (b) to form a homogeneous liquid solution of fill/resin is reading on the claimed process of current application except two things as: (A) using nanotube as filler and (B) using the polymer in the form of melt.

9. In a very close examination, each of **Shambaugh and Lobovsky** has individually disclosed that **nanotube as filler can be effectively dispersed in a matrix material (polymeric resin) and the preparation can be without a solvent** (which may be equivalent to “polymer melt”) (see “556” at abstract, line 1-11; column 3, line 8-47; column 4, line 35-41) (see “628” at abstract, line 1-3; column 3, line 1-41; column 4, line 37-41). By doing so, such a nanotube/solvent/matrix mixture can be used to form a composite material for some “**melt** applications” such as a draw fiber with special properties for special applications (see “556” at abstract, line 1-4; see “628” at abstract, line 1-9). Attention is directed to the fact that “the size of nanotube is smaller than 10 microns” according to reference “556” on column 1 at lines 30-34 is reading on the new limitation of smaller than 100 microns. Therefore, **the size of nanotube is clearly fallen within the scope of MaAllister’s particular filler**. In order to further support

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the using such a specific “**carbon**” nanotube as filler, attention is directed to the fact that **carbonaceous materials** may be included by McAllister (column 6, line 68).

With respect to new limitation added onto parent Claim 1 as” at least a portion of said plurality of nanotubes are characterized as being agglomerates of nanotubes smaller than about 100 microns”, it is unclear that how much is involved to be called a portion. After a close examination, Examiner suggests using a more clear language. In a very close examination, the disclosure in paragraph # **0019** does not show or suggest any point or range. As known in the art, the issue of “inherence” may be involved since such a behavior may be just a nature of nanotubes.

10. In light of the fact that all involving references are dealing with making a mixture of fill/resin/solvent and for the same composite application, one having ordinary skill in the art would therefore have found it obvious to **modify MaAllister’s composite making process by replacing regular particular filler with nanotube** as taught by Shambaugh or Lobovsky. By doing so, one would expect all the embodiments in the same genus would succeed in making such a composite since the same size on filler is used. Additionally, more diversified composite products such as a draw fiber with special properties for special applications may be obtained.

In summary, 103 rejections relying on the use of McAllister in view of Shambaugh or Lobovsky are thereby sustained with some modification due to current claim situation.

Conclusion

11. Applicant's amendment **necessitated the new ground(s) of rejection presented in this**

Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

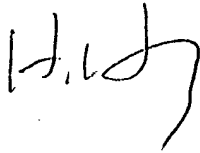
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu** whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

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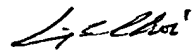
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Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

September 19, 2006


LING-SUI CHOI
PRIMARY EXAMINER